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10/604,011	06/20/2003	Stephen E. Greco	FIS920030144US1	1010

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/604,011
Filing Date: June 20, 2003
Appellant(s): GRECO, STEPHEN E.

Spencer K. Warnick
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 29, 2006 appealing from the Office action mailed December 28, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,498,385	Daubenspeck et al.	12-2002
5,953,577	Huggins	09-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

I) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

II) Claims 1-4, 7-30, are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent No. 6,498,385 (Daubenspeck et al, hereinafter referred to as Daubenspeck).

Daubenspeck, in col 7, lines 16-67, in col 8, lines 1-67, in col 10, lines 23-50, discloses a method of opening an integrated circuit (deleting the fuse in the circuit device) comprising lithographically patterning the resist layer (exposing, and developing the exposed resist) formed on the integrated circuit structure (IC chip) to form an opening in the resist, etching the underlying exposed barrier layer on the fuse element,

the fuse is coupled to a plurality of terminals (landed on a upper surface of the wire/fuse element, see figure 1F) and is the (non-last metal layer (LM-1 layer), etching the exposed fuse (exposed through the patterned resist) by wet etching using acid and water, stripping the remaining resist (claims 1-4, and 11-12, 19, 23, and 26). Daubenspeck, in col 10, lines 53-67, in col 11, lines 1-22, discloses that the opening in the structure includes an opening to each side of the terminal (copper) (see figure 1G), wet etching the fuse elements leaves behind the metal liner segments of the terminal intact, but removes the fuse (copper segments, therefore removing the contact of the liner) (see figures 7A through 7D) (claims 7-8, 10, 14, 16, 21, and 30) Daubenspeck, in col 10, lines 24-67, discloses that the fuse includes a wire and the terminals are positioned (fully-landed) on the fuse wire (copper) (see figure 1G), wherein each terminal includes a Ta or TaN liner, each terminal comprises a horizontal wire and a vertical stud (see figure 1G, reference 114a) said fuse wire couples the vertical studs, and the horizontal wire couples the fuse to the terminals (claims 9, 13, 15, 17-18, 20, 22, 24-25, and 27-29).

Claim Rejections - 35 USC § 103

III) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

IV) Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,498,385 (Daubenspeck et al., hereinafter referred to as Daubenspeck) in view of U. S. Patent No. 5,953,577 (Huggins).

Daubenspeck is discussed in paragraph no. II).

The difference between the claims and Daubenspeck is that Daubenspeck does not disclose that the opening is formed by applying a polymer and ablating the polymer with a laser to define the at least one opening (claim 5).

Huggins, in col 7, lines 25-40, discloses the use of laser ablation methods to form an opening in the polymer formed on the structure.

Therefore, it would be obvious to a skilled artisan to modify Daubenspeck by employing the laser ablation techniques suggested by Huggins because Huggins, in col 7, lines 25-34, discloses that such techniques enables the use of non-precision masks during exposure, and enables positioning of the mask at desired and selected portions of the resist polymer for removal by laser ablation.

(10) Response to Argument

A) Appellant argues that Daubenspeck does not disclose a fuse element that is located in a non-last metal layer.

Daubenspeck, in col 3, lines 57-67, and in col 4, lines 1-5, and in figure 1E, discloses a fuse element (reference 114) that is located in a non-last metal layer. Daubenspeck, in col 3, lines 46-60, and in col 4, lines 9-11, discloses that the metal structure can be an upper metal layer and a lower metal layer, and that the fuse can be formed in the Ta/TaN layer which is a non-last metal liner layer. Additionally,

Daubenspeck, in col 8, lines 41-45, and in figure 2, discloses forming the fuse line in a non-last metal layer i.e., in a LM-1 layer.

B) Appellant argues that Daubenspeck does not disclose that the terminals are fully-landed on the upper surface of a wire of the fuse element.

Daubenspeck, in figure 1E, and 1F, and in col 10, lines 8-15, discloses that the terminals (part of reference 114, see the terminals located in a layer referred to as references 106b and 106d which is not the same layer as the fuse itself) are fully landed on the upper surface of a wire (reference 108a and 108b) of a fuse element (copper wire segments, references 108a, and 108b). The fuse terminals are extended through another layer (reference 106b and 106d) and landed on to the surface of the bottom wire segment of the fuse element.

C) Appellant argues that Daubenspeck fails to disclose that the opened fuse line includes a metal liner.

Daubenspeck, in figure 1G, in col 3, lines 60-65, discloses that the liner segments (or metal liner) remains after the selective removal of the fuse i.e., the process of forming an opened fuse line by exposing to an etchant does not result in the removal of the liner, because the etchant only removes the copper fuse and not the liner, and therefore, the opened fuse line includes a metal liner.

D) Appellant argues the Daubenspeck does not disclose an opened fuse area with the metal liner being intact immediately adjacent to, and in non-contact with a plurality of terminals.

Daubenspeck, in col 3, lines 60-67, in col 4, lines 1-5, and in figure 1G, discloses that although the copper fuse is exposed to an etchant and removed, the etchant used

is selective to the copper and does not attack the liner, and therefore the liner is left intact, and although the liner is positioned adjacent to part of the terminal, it is not in contact with a plurality of terminals once the fuse 114c is removed, and hence it is not in contact with both the terminals (i.e., the liner is in non-contact with a plurality of terminals) present on either side, resulting in a liner segment that is isolated on at least one side.

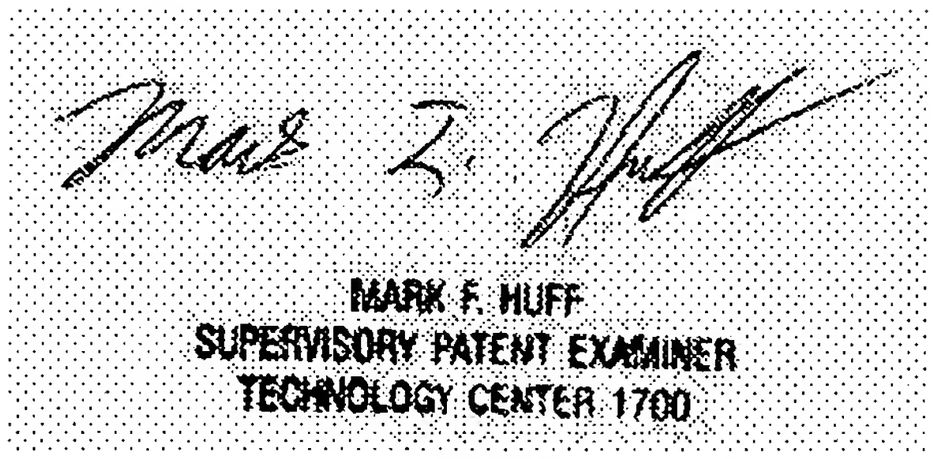
(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

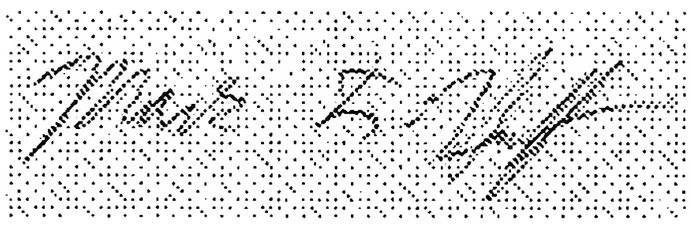
Respectfully submitted,

Dcd



Conferees:

Jennifer Michener



Mark F. Huff
SPE 1756